CLAIMS

What is claimed is:

1. A process for identifying a disease associated molecular marker which disease associated molecular marker is associated with a subset of cells, said process comprising the steps of:

a) incubating cells of a species with a library of binding molecules, combined with an incubation with diseased cells of the species;

b) obtaining, from said incubation, a collection of diseased cells essentially free from non-diseased cells, by sorting said collection of diseased cells from non-diseased cells according to parameters that distinguish between said collection of diseased cells and said non-diseased cells;

c) obtaining binding molecules from said collection of diseased cells;

d) selecting, from said obtained binding molecules, an individual binding molecule that preferentially binds to said diseased cells in comparison to binding to said non-diseased cells;

e) identifying a molecular marker which, in its disease associated form, binds to said individual binding molecule selected under step d), said disease associated molecular marker being associated with said collection of diseased cells obtainable according to step b); and

f) establishing that said disease associated molecular marker has a counterpart associated with non-diseased cells wherein said counterpart is less capable of binding said individual binding molecule.

2. The process according to claim 1, further comprising the step of:

establishing that said counterpart and said disease associated molecular marker differ in at least one post-translational modification.

3. The process according to claim 2, wherein said post-translational modification is a glycosylation modification.

4. The process according to any one of claims 1-3, further comprising the steps of:

- recovering said individual binding molecule which binds to said disease associated molecular marker; and

- characterizing said individual binding molecule.

5. A process for identifying a binding molecule capable of binding a subset of diseased cells, said process comprising the steps of:

a) incubating cells of a species with a library of binding molecules, combined with an incubation with diseased cells of said species;

b) obtaining, from said incubation, a collection of diseased cells essentially free of non-diseased cells, by sorting said collection of diseased cells from non-diseased cells according to parameters which distinguish between said collection of diseased cells and said non-diseased cells;

c) obtaining binding molecules from said collection of diseased cells;

d) selecting, from said obtained binding molecules, an individual binding molecule capable of preferentially binding to said diseased cells as compared to binding to said non-diseased cells;

e) recovering said individual binding molecule selected in step d); and

f) establishing that said individual binding molecule preferentially binds to disease associated molecular marker, said disease associated molecular marker being associated with said diseased cells, said disease associated molecular marker further having a counterpart associated with non-diseased cells wherein said counterpart is less capable of binding said individual binding molecule.

6. The process according to claim 5, further comprising the step of:

establishing that said counterpart and said disease associated form differ in at least one post-translational modification.

7. The process according to claim 6, wherein said post-translational modification is a glycosylation modification.

8. The process according to any one of claims 1-7, wherein said sorting is performed using a molecule that preferentially interacts with said diseased cells as compared to said non-diseased cells.

9. The process according to any one of claims 1-8, wherein said sorting is performed with a molecule that preferentially interacts with said non-diseased cells as compared to said diseased cells.

10. The process according to any one of claims 1-9, wherein said library of binding molecules is a phage antibody display library.

11. The process according to claim 10, wherein said phage display library comprises at least 1×10^8 specificities.

12. The process according to any one of claims 1-11, wherein said sorting is conducted using a fluorescence activated cell sorter.

13. The process according to any one of claims 1-12, wherein said parameters are fluorescence based parameters.

14. The process according to any one of claims 1-13, wherein said diseased cells are present in a cell population derived from a mammalian species suffering from cancer, diabetes, Alzheimer's disease, multiple sclerosis, rheumatoid arthritis, inflammatory disease or viral infections.

15. The process according to any one of claims 1-14, wherein said diseased cells are tumor cells.

16. The process according to claim 15, wherein said tumor cells are selected from the group consisting of multiple myeloma cells, breast tumor cells and colon carcinoma cells.

17. A disease associated molecular marker produced by the process according to any one of claims 1-16.

18. A binding molecule produced by a process according to any one of claims 1-16.

19. The binding molecule of claim 18, wherein said disease associated molecular marker is a CD46 protein.

20. The binding molecule of claim 19, wherein said CD46 protein comprises human CD46 protein.

21. A binding molecule capable of specifically binding to an epitope present in a subset of CD46 proteins.

22. The binding molecule of claim 21, said binding molecule capable of distinguishing a subset of CD46 comprising cells.

23. The binding molecule of claim 22, wherein said subset of CD46 comprising cells comprises a hemopoietic cell, a cervix cell, a colon cell, a kidney cell or a liver cell.

24. The binding molecule of claim 23, wherein said hemopoietic cell is derived from a B-cell.

25. The binding molecule of any one of claims 18-24, capable of binding to a multiple myeloma cell.

26. The binding molecule of any one of claims 21-25, wherein said CD46 protein comprises human CD46 protein.

27. The binding molecule of any one of claims 18-26, wherein said binding molecule is an antibody or part or derivative thereof having the binding activity of an antibody.

28. The binding molecule of claim 27, wherein said binding molecule is a human or humanized antibody.

29. The binding molecule of any one of claims 18-28, further comprising a tag associated with said binding molecule.

30. The binding molecule of claim 29, wherein said tag comprises a toxin, a radioactive substance, or a toxin and a radioactive substance.

31. A method for treating a subject suffering from, or at risk of suffering from, a disease, said method comprising:

administering to said subject a therapeutically acceptable amount of the binding molecule of any one of claims 18-30.

32. The method according to claim 31, wherein said disease is a neoplastic disease.

33. Use of a binding molecule according to any one of claims 18-30 for the preparation of a medicament.

34. Use according to claim 33, for the treatment of a neoplastic disease.

35. A method for typing a cell, said method comprising:

determining whether the cell specifically binds the binding molecule of any one of claims 18-30.

36. Use of an epitope expressed on a subset of CD46 expressing cells as a marker for neoplastic cells.

37. A nucleic acid encoding a binding molecule, or a part thereof, according to any one of claims 18-30.

38. A cell comprising a nucleic acid according to claim 37.

39. The cell of claim 38, wherein said cell is a primate, rodent, bird, or plant cell.

40. The cell of claim 38 or claim 39, wherein said cell is a human cell.

41. The cell of any one of claims 38-40, said cell further comprising:

means for the conditional expression of a nucleic acid of interest.

42. The cell of claim 41, wherein said means for the conditional expression of a nucleic acid of interest comprises a tetracycline responsive expression system.

43. The cell of any one of claims 38-42, wherein said cell comprises a nucleic acid encoding an early protein of adenovirus or a functional part, derivative and/or analogue thereof.

44. The cell of claim 43, wherein said early protein comprises adenovirus E1 or a functional part, derivative and/or analogue thereof.

45. The cell of claim 43 or claim 44, said cell further comprising:

adenovirus E2A or a functional part, derivative and/or analogue thereof.

46. A plant or a non-human animal comprising the cell of any one of claims 38-45.

47. The plant or non-human animal of claim 46, said plant or non-human animal being transgenic for the nucleic acid of claim 37.

48. A gene delivery vehicle comprising the nucleic acid of claim 37.

49. A kit comprising the binding molecule of any one of claims 18-30.